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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/313,184	05/18/1999	KANAME MIWA	Q54404	3561

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EXAMINER

OLSEN, KAJ K

ART UNIT PAPER NUMBER

1753

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/313,184

Applicant(s)

MIWA ET AL.

Examiner

Kaj K Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 16-20,22-24 and 30-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 36 is/are allowed.
- 6) ☐ Claim(s) 16-20,22-24,30-35 and 37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 37 is rejected under 35 U.S.C. 102(b) as being anticipated by GB 2,311,377 A. GB '377 is being cited and relied on for the first time with this office action. Its use was necessitated by new claim 37.

3. GB '377 discloses a sensor element comprising negative and positive electrodes (2a, 3a) sandwiched between two solid electrolyte substrates (fig. 1-3). GB '377 further discloses the presence of a gas diffusion portion 6 for introducing gas into the negative electrode and a gas outlet hole 8 formed in one of the solid electrolyte substrates, which would allow oxygen to be released from the positive electrode. Compare fig. 1 of GB '377 with fig. 10 of the instant invention. In addition, see p. 11, line 15 through p. 12, line 18.

***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 16-20, 22-24 and 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato (USP 5,672,811) in view of Makino et al (USP 5,676,811). Makino is being cited and relied on for the first time with this office action.

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3. These claims were previously rejected under 35 U.S.C. 102 and 103 over Kato '841 because electrode 28 is shown to have an area that is at least twofold of the electrode 24 (see previous office action for details as to how Kato '841 reads on the claimed subject matter). In the arguments, applicant urges that there is no discussion in Kato '841 about the width of the electrodes shown in fig. 2. Absent an understanding of the width, it is unclear whether the figure of Kato is suggestive of a twofold difference in area. This examiner agrees with the applicant's argument and has withdrawn the rejection under Kato '841 alone. However, having the electrodes of a gas sensor extend over the entire width range of a given chamber was known in the art. In particular, Makino demonstrates this. See, as an example, fig. 2 where pump electrode 8 and reference electrode 13 are shown to extend over the entire width of their respective chambers. There are a number of reasons one possessing ordinary skill in the art would have been motivated to do so. One, making the electrodes extends provides the maximum surface area for the electrode, thereby reducing any effective resistance, increasing the magnitude of the diffusion control. In addition, large electrodes (i.e. electrodes that extend the entire width of their chamber) also allow more sample to be analyzed per unit time. In addition, electrodes that span the entire chamber width would prevent any localization of NO<sub>x</sub> concentration. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Makino for the sensor of Kato '811 in order to utilize any of the set forth advantages given above.

4. Claims 16-20, 22-24 and 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-38845 or Kato et al (USP 6,036,841) in view of Makino.

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5. JP '845 and Kato '841 were utilized to reject these claims for reasons set forth in the previous office action. Analogous to Kato '811 above, the examiner is withdrawing the rejection over JP '845 or Kato '841 alone. Instead, the examiner had added the teaching of Makino for the same reasons illustrated above. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Makino for the sensor of either JP '845 or Kato '841 in order to utilize any of the set forth advantages given above.

***Allowable Subject Matter***

6. Claim 36 is allowed (see discussion below).

***Response to Arguments***

7. Applicant's arguments with respect to the claims have been considered and are partially persuasive. The examiner is withdrawing the rejections utilizing secondary teachings Yagi, Patrick and JP '754. With respect to Yagi, it is unclear to this examiner how Yagi would teach any of the primary references (all NOx sensors) to be humidity sensors (however, humidity is still only intended use so the rejection in view of the primary teachings without Yagi remain). With respect to Patrick, it is unclear how Patrick would teaching any of the primary references how to layer the various pump cells over each other while at the same maintain the claimed requirement that the oxygen pump electrodes be on the same side of the third solid electrolyte layer. With respect to JP '754, this teaching appears to teach making one of the electrodes larger so that it larger than the electrolyte layer in order to discharge gas (see p. 7 of the applicant's translation of that document). That does not appear to be relevant to the primary references

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where the reference electrode is already exposed to a gas discharge passage (i.e. the reference gas passage). The examiner also agrees with the applicant that it is not sufficient to rely on the primary teachings alone for the claimed electrode area relationship. To that matter, the examiner has modified the rejection by adding the teaching of Makino and these arguments are now moot.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Thursday from 6:30 A.M. to 4:00 P.M. and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Kaj Olsen', with a long, horizontal flourish extending to the right.

Kaj Olsen Ph.D.

Primary Examiner

AU 1753

May 28, 2004